**Activity Safety Form**

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| **Program:** | jrDEEP Summer Academy |
| **Course Title:** | Cool Code |
| **Instructor(s):** | Connor Smith, Anastasiya Martyts |
| **Season:** | Summer |
| **Year:** | 2014 |
| **Project/Activity Name:** | Writing Functions |
| **Source:** |  |
| **Grade Level:** | 5-6 |
| **Topics Covered By Activity:** | -Uses and Application of Functions  -Writing simple functions |
| **Objective (Learning Outcomes):** | -To be able to write reusable code within functions to improve code readability and efficiency |
| **Safety Approval Date:** |  |

Please identify specific safety hazards in the table below

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| --- | --- | --- |
| **Check if applicable** | **Hazard** | **Why is this required?** |
| X | Electricity | To power Raspberry Pi’s and monitors |
|  | Open Flame |  |
|  | Projectiles |  |
|  | Natural Gas |  |
|  | Compressed Air |  |
|  | Glassware |  |
|  | Dissection Equipment |  |
|  | Biological Material/Specimen |  |
|  | Chemicals |  |
|  | Tools (ex. soldering iron, hacksaw, drill)  **Please specify in the materials list** |  |
|  | Other: |  |

Safety Materials/P.P.E. Required for this Activity

|  |  |  |
| --- | --- | --- |
| **Check if Required** | **Safety Material/Personal Protective Equipment (P.P.E.)** | **Explanation (Specify when this is required i.e. is this during preparation and/or while the activity is taking place and who wears/uses the piece of P.P.E. i.e. Instructor, student etc. please be explicit)** |
|  | Goggles |  |
|  | Lab Coats |  |
|  | Nitrile Gloves |  |
|  | Table Coverings |  |
|  | Fume hoods |  |
|  | Biosafety Cabinets |  |
|  | Spill Kits |  |
|  | Disposal Mechanisms (ex. broken glass, biologics, chemicals) |  |
|  | N95 Masks |  |
|  | Other: |  |

**Background Information:**

A function’s primary use is to reuse already written code in multiple places throughout the program body. It allows for long, repetitive programs to become far more condensed and readable. It also allows for easier debugging as it will no longer be necessary to make changes throughout the program to fix one small error; the fix can be applied to the function and it will become implemented throughout.

**Components**

* A name [ie. addNumbers]
* Arguments [ie addNumbers(number1, number2)]
* Lines of Code [number3 = number1 + number2]
* A return statement [return number3]

**Usage**

In order to use functions, it must be ‘called’ within the main program body. To do this, it can be as simple as writing the function’s name with the proper arguments. The function will then take those arguments and perform its duty.

**Making a function**

A function must always have a name and at least one line of code to be useful. They do not always require return statements or arguments, but most applications will require these as well. You can create variables within a function, but these variables will be lost once the function finishes. A return statement allows for data from the function to be stored outside of the function, preventing it from being destroyed with the function. Below is a simple adding function:

*addNumbers(int number1, int number2)*

*int number3 = number1 + number2*

*return number3*

Therefore, number3 would be saved (or ‘returned’) outside the function.

**Return Statements**

A return statement can be used to set the value of something once the function has finished. For instance, if a function’s purpose is to add two numbers, you would use this line in the program body to store the result in the *sum* variable.

*sum = addNumbers(10,2)*

The above line would set *sum* to be equal to *12* . Notice that number3 has disappeared, but its value has been saved in the *sum* variable.

**Benefits**

* Readability. Sometimes you don’t want to read many lines of code, you just want to know what the end result of those lines will accomplish. A descriptive function name would allow for this.
* Smaller Code. Instead of having to repeat the same block of code over and over again, you can use functions to reduce that repetition to repeating only one line of code (the function call itself)
* Easier Changes. You will only have to make a change in one part of the code (the function definition) rather than having to change the numerous places the function was called. This reduces user error when making these changes.

**Preparation:** Be familiar with the background information of loops

**Procedure:**

1. Demonstrate simple functions.
2. Discuss the uses and applications of functions detailed above.
3. Demonstrate more complex functions.
4. Have the campers write a ‘Hello \_\_\_\_’ function which takes a name as an argument
5. Challenge the campers to write a more complex function

**Additional/Extension Activities & Procedure (if applicable):**

* Functions with multiple return statements/flow control
* Returning more than one variable/piece of information

**Student Take Home/Materials Kept:**

**None**

Materials **(Please include all materials including consumable items, tools, stationery, arts & craft supplies, chemicals, biologics, etc.).** Please identify (in the notes column) any hazardous materials PRODUCED as a result of the project/activity.

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| **Item** | **Quantity** | **Purpose in Activity** | **Route of Transmission** | **Anticipated Health Risk** | **Safety Precautions** | **Storage/Disposal Arrangements** | **Notes** |
| Raspberry Pi | 1 Each | Programming |  |  | Cable organization, tape cables to floor if necessary |  |  |
| SD card (4 GB) | 1 Each | Programming |  |  |  |  |  |
| Power Cable | 1 Each | Programming |  |  |  |  |  |
| Monitor | 1 Each | Programming |  |  |  |  |  |
| HDMI Cable | 1 Each | Programming |  |  |  |  |  |
| HDMI to DVI Adaptor | 1 Each | Programming |  |  |  |  |  |
| Keyboard | 1 Each | Programming |  |  |  |  |  |
| Mouse | 1 Each | Programming |  |  |  |  |  |
|  |  |  |  |  |  |  |  |

Use the below chart to inform how you fill out various sections of your Activity Safety Sheet.

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| --- | --- | --- | --- |
| Anticipated Health Risks (Use the following relevant descriptions in the materials table) | | Safety Precautions (Use these and other descriptions the show how you will specifically address each of the safety precautions mentioned on the left side of this table.) | |
| 1 | Materials are sharp and may cut skin (Utility Knives, Scalpels, Scissors) | 1 | Instructors will advise on the appropriate use of materials (for 1-10 above) |
| 2 | Materials may poke or pierce skin (Wooden Skewers, Sticks) | 2 | Instructors will review the MSDS for materials prior to and during the activity (3-8) |
| 3 | Materials are toxic if ingested (Chemicals such as Bleach, Detergents, Indicators) | 3 | Participants will wear dust or N95 masks at all times (4 and 5) |
| 4 | Materials are hazardous if inhaled (Chemicals, Powders, Dust, Solder) | 4 | Participants will wear nitrile gloves at all times (6) |
| 5 | Materials are an irritant to lungs (Chemicals, Powders, Dust) | 5 | Participants will wear goggles at all times (7) |
| 6 | Materials are an irritant to skin (Chemicals, some Soaps, Allergens) | 6 | Students will be instructed on the use of the eye station in-lab (7) |
| 7 | Materials are an irritant to eyes (Chemicals, Powders, Dust) | 7 | Instructors will have a fire extinguisher within arm’s reach while performing activity (8) |
| 8 | Materials are flammable/Use of Open Flame (Alcohol, Gases, Fuels, Matches) | 8 | Instructors will establish a safety perimeter of 5m while performing the activity/during testing (8 and 10) |
| 9 | Participants may present serious allergies (Nuts, Shellfish, Milk, Eggs, Fruits, Food Colouring) | 9 | Instructors will review student allergies prior to commencing activity (9) |
| 10 | Materials are or can be involved as projectiles (Rocks, Golf Balls, Rockets) | 10 | Instructors will advise of any hidden allergens (9) |
| 11 | Materials present a slipping hazard if spilled | 11 | Instructors will monitor participants for indications of an allergic reaction (9) |
| 12 | Materials are hot and may burn skin. (glue guns, soldering irons) | 12 | Instructors will review the procedure with students, prior to testing (1-10) |
|  |  | 13 | Instructors will explain any necessary emergency protocol (always) |
|  |  | 14 | Instructors will debrief and discuss any sensitive issues before, during and after the activity (always) |
|  |  | 15 | Only Instructors with training will complete the specified activity or demo always. |
|  |  | 16 | Spill Clean up kit provided (11) |
| Routes of Transmission | | Questions to ask about your Materials and Activity (Address any that are relevant in your above Activity Safety Sheet) | |
| 1 | Eyes | 1 | Are there any ethical concerns regarding your workshop? |
| 2 | Skin contact | 2 | Are there any sensitive issues or activities? |
| 3 | Inhalation | 3 | Are there safety concerns if specific procedures are not followed? |
| 4 | Ingestion | 4 | Do any of the materials have an MSDS? |
| 5 | Other (please specify) | 5 | Do any of the materials or activities require special training? |
|  |  | 6 | Questions to ask about your Materials and Activity (Address any that are relevant in your above Activity Safety Sheet) |